EXTRACTION AND CHARACTERIZATION OF PROTEIN FROM TEA SEED (*Camellia oleifera* Abel) MEAL. THESIS ADVISOR : ASSOC. PROF. JIRAWAT YONGSAWATDIGUL, Ph.D., 104 PP.

EXTRACTION/TEA SEED MEAL/PROTEIN/CHARACTERIZATION/ FUNCTIONAL PROPERTIES

Seed meal of *Camellia oleifera* Abel is a byproduct after tea oil extraction. It is normally used as organic fertilizer with low economic value. The objective of this study was to isolate and characterize proteins from defatted seed meal of *C.oleifera* Abel. The optimal extraction condition was using deionized water at pH 7 as an extractant with the ratio of meal to water of 1:20, at 40^{o}C for 60 min. Protein recovery was 50.4%. The proteins were isolated using size exclusion, followed by anion exchange chromatography. The isolated protein showed light yellow appearance with relatively low phenolic content of 10.7%. Proteomic analysis including SDS-PAGE, 2-dimensional gel electrophoresis and LC-MS/MS were employed. SDS-PAGE analysis showed 6 major proteins in the tea seed meal and 5 major proteins in the tea seed protein isolated (TSPI). Two-dimensional gel electrophoresis revealed 12 major protein spots displaying molecular mass of 21-28 kDa with isoelectric points from 3.6-10. Protein identification by LC-MS/MS indicated peptide homology with G-type lectin S-receptor-like serine / threonine-protein kinase RLK-like from *Solanum lycopersicum*, 11s globulin-like protein from *Actinidia chinensis* and Argonaute protein

group from *Theobroma cacao*. The FT-IR spectra of purified tea seed protein exhibited glycoprotein characteristics. The TSPI showed good ABTS radical scavenging ability and metal chelation. In addition, isolated tea seed protein exhibited good functional properties as compared with casein. Emulsifying activity of isolated tea seed protein was higher than that of casein at pH 3 and 5 ($p < 0.05$). The foaming ability of isolated tea seed protein was lower than that of casein, except for pH 5. These results demonstrated that tea seed protein extracted from tea seed meal could be a potential source for protein recovery to be used as a functional protein ingredient.

School of Food Technology Student's Signature_____

Academic Year 2013 Advisor's Signature_____